

Remarks/Arguments

The Office Action dated March 10, 2009 has been received and carefully studied.

The Examiner states that the references cited in CA and CC fail to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP §609 because they do not have an English translation.

The Examiner is respectfully requested to consider these references, as they have been properly filed. The Examiner is incorrect in refusing to consider these references, as the Rule 37 CFR 1.98 plainly states the requirements for a proper IDS. These requirements include:

- (1) A list of all patents, publications, applications, or other information submitted for consideration by the Office. U.S. patents and U.S. patent application publications must be listed in a section separately from citations of other documents. Each page of the list must include:
 - (i) The application number of the application in which the information disclosure statement is being submitted;
 - (ii) A column that provides a space, next to each document to be considered, for the examiner's initials; and
 - (iii) A heading that clearly indicates that the list is an information disclosure statement.
- (2) A legible copy of:
 - (i) Each foreign patent;
 - (ii) Each publication or that portion which caused it to be listed, other than U.S. patents and U.S. patent application publications unless required by the Office;
 - (iii) For each cited pending unpublished U.S. application, the application specification including the claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion; and

- (iv) All other information or that portion which caused it to be listed.
- (3)
- (i) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from applicant's specification or incorporated therein.
 - (ii) A copy of the translation if a written English-language translation of a non-English-language document, or portion thereof, is within the possession, custody, or control of, or is readily available to any individual designated in § 1.56(c).

The explanation of relevance was provided in the earlier submitted European search report, dated May 13, 2005, which was filed on July 25, 2006. Additionally, a translation is only required if it is within the possession, custody or control of, or is readily available to the inventor or his attorneys. As an English translation was not available, it was not submitted. However, in accordance with the underlined portion of the rule, a translation is not required in this situation. Therefore, the Examiner is requested to consider these references.

The Examiner objects to the abstract because it is not limited to a single paragraph within a range of 50 to 150 words. The Examiner also objects to the abstract because the term "resp." is not clearly defined. The Examiner also noted that "Fig. 1" must be deleted. By virtue of the accompanying amendment, all of these deficiencies have been corrected.

The Examiner objects to the specification because the term "resp." is not clearly defined. Furthermore, the

Examiner objects to the word "distribution". By virtue of the accompanying amendment, these have been corrected.

The Examiner objects to claims 4 and 14 as being in improper form because a multiple dependent claim must refer to other claims only in the alternative. By virtue of the accompanying amendment, these claims have been amended to depend only from their respective independent claims.

The Examiner objects to claims 5-10 and 15-17 as being in improper form as they are multiple dependent claims that are dependent on other multiple dependent claims. By virtue of the accompanying amendment, these claims have been amended to depend only from their respective independent claims.

The Examiner objects to claim 18 for being dependent on both a system claim and a method claim. By virtue of the accompanying amendment, this claim has been deleted.

To improve the readability of these amended claims, all of the original claims have been cancelled and replaced with claims of substantially the same scope, which correct the previously described deficiencies.

The Examiner rejects claims 1-3, 11-13 and 18 under 35 U.S.C. §102(b) as being anticipated by Markson et al. (U.S. Patent No. 6,246,367). With respect to claim 1, the Examiner states that Markson discloses a system for recording, transmitting and analyzing data and information accrued from, in particular low-frequency, electromagnetic radiation, comprising several spatially separated measuring stations with at least one respective, in particular, broadband,

antenna body for recording signals which are assignable to the electromagnetic radiation and with at least one respective time measurement facility, in particular at least one respective GPS clock for determining the respective time progression, in particular the respective arrival time, of the recorded signals, characterized in that the electromagnetic radiation originates from at least one impulse source of natural and/or artificial origin, in particular from at least one atmospheric discharge or from at least one transmitter and that the altitude of the impulse source, in particular the emission altitude or the transmission altitude, and/or the directionality, in particular the spatial direction path, of the impulse emission or the impulse broadcast caused by the impulse source may be localized in that the deviation of the arrival time of the signal on the measuring system located closest to the impulse source from the arrival time on at least one, preferably, at least two, measuring stations which are not located closest to said impulse source, is determinable. The Examiner cites passages from columns 6-8 in support of his position.

In response to this rejection, the limitations of claim 2 have been incorporated into the new independent claim 19. The Examiner rejects claim 2, stating that Markson discloses a system for recording, transmitting and analyzing data, where the directionality of the impulse emission is identifiable as being essentially vertical when the amplitude of the signal is reciprocally proportional to the distance between the impulse source and the respective measuring stations and is identified as being essentially horizontal when the amplitude deviates from the reciprocal

proportionality, wherein said deviation is correctable by considering the altitude angle and the angle between the impulse emission and the direction of the respective measuring station.

This rejection is respectfully traversed. Although the Examiner cites several passages as supporting his rejection, none of these disclose that Markson can determine a horizontal emission. In fact, Markson focuses on the fact that "initial IC and G lightning discharges are substantially vertical". Column 5, lines 6-8. Furthermore, Markson specifically states "it is believed, but without limitation thereto, that RF energy transmitted by virtually all initial lightning discharges within a cloud are substantially vertical with respect to ground". Column 5, lines 63-66. It is these initial discharges that Markson is focused on, and accordingly, Markson does not disclose or suggest any mechanism to detect, record or analyze horizontal emissions. Furthermore, Markson does not disclose that the deviation from the inverse proportionality can be corrected by considering the altitude angle and the angle between the impulse emission axis and the direction of the respective measuring station.

By identifying horizontal emissions, a more reliable differentiation between cloud-ground (CG) and cloud-cloud (IC or CC) lightning can be achieved. Markson does not give any indication as to the horizontal identification of the directionality of the impulse emissions.

Furthermore, it is recognized for the first time in the present disclosure that in cases of strong deviation for the

1/R dependence, there is a predominantly horizontal discharge channel, wherein the correction of the deviations by the radiation characteristic is taken into account according to two angles, the altitude angle and the angle between the impulse emission axis and the measuring station.

Based on this, it is believed that claim 19 is now in condition for allowance, as the identification of horizontal emissions is not disclosed or suggested by Markson.

The Examiner rejects claim 3, stating that Markson discloses that several signals that originate from impulse sources in a spatially limited and/or time range can be combined and that the deviation in amplitude can be correlated with the group in order to eliminate a damping effect conditional upon a variable ground conductivity. The Examiner cites the passage on columns 11 and 12 as support.

This rejection is respectfully traversed. Markson does not disclose that groups of emissions, such as lightning strokes, stemming from close spatial ranges, can be analyzed together. The passage that the Examiner cites describes how the range and bearing of an initial pulse can be determined using a E-Field antenna, a reference loop antenna and a quadrature antenna (see Figure 10), all of which are measuring the same discharge. There is no disclosure that a group of pulses are analyzed together. However, advantages can be achieved by analyzing groups of pulse. For example, by doing so, it can be determined whether the dampening effects with the same or a very similar running distance are constant, or whether they only occur with individual horizontal impulses. Markson notes that a group of strokes

can be studied, but only "to provide verification of a first initial pulse". Column 7, lines 40-42. Since further analysis of groups of strokes is not disclosed or suggested by Markson, claim 20 is believed to be allowable.

Markson also notes that with respect to known very low frequency (VLF) radiation detection systems, "there are considerable limitations associated therewith due to the inherent variation in lightning stroke discharge amplitudes". Column 2, lines 16-19. Markson also discloses that the preferred frequency range is 150 kHz to 50 MHz. Markson is concerned with VHF discharge, and teaches away from using VLF as a way of detecting lightning. To further distinguish the present invention, new dependent claims 28 and 35, stating that low frequency radiation is measured, have been added.

It is believed that claim 19, and all its dependent claims are in condition for allowance by virtue of these amendments and arguments.

The Examiner rejects claim 11 under 35 U.S.C. §102(b), stating that Markson teaches a method for recording, transmitting and analyzing data and information which includes recording signals using several spatially separated measuring stations, determining the respective time progression at the stations, localizing the amplitude and/or directionality of the impulse emission by determining the difference between the arrival time at the measuring station closest to the impulse source and the arrival time at measuring stations that are not located closest to the impulse source.

In response to this rejection, the subject matter of claim 12 has been incorporated into the independent method claim 29. The Examiner rejects claim 12 using the cited passages from claim 2 for support. For the reason presented above with respect to amended claim 19, the newly amended method claim 29 is believed to be allowable.

The Examiner rejects claim 13, using the passages cited in the rejection of claim 3. For the reasons noted above with respect to claim 3, amended claim 30 is also believed to be in condition for allowance.

The remaining dependent claims have been written in proper form and are believed to be allowable by virtue of their dependence on the newly amended independent method claim 29.

Reconsideration and allowance are respectfully requested in view of the foregoing.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Robert Frame', with a stylized flourish extending to the right.

Robert Frame

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